wellcare® information for

Environmental Health Specialists

Septic Systems

One in five U.S. households rely on onsite wastewater treatment systems, also known as septic systems, to treat and dispose of wastewater. Microbiological components in untreated or improperly treated wastewater pose a serious risk to human health, driving the need to educate well owners on the importance of maintaining their septic systems. Homeowners with both wells and septic systems must take care to maintain these systems to ensure a properly functioning septic system and the safety of their well water.

Environmental Health Specialists (EHS) are the best local source of information for well owners with septic systems. EHS are generally responsible for protecting the public health and our environment through:

- Permitting and approval of well and septic system locations
- Inspecting new wells and septic systems post-construction
- Sampling or reviewing water test results to certify water quality
- Providing well owners with water testing recommendations
- Educating well owners on proper maintenance of residential well and septic systems

This wellcare® information sheet provides guidance for EHS on how to educate homeowners on best management practices for their septic systems. Additional information on water testing, water treatment and septic systems can be found at https://www.watersystemscouncil.org/water-well-help/wellcare-info-sheets/.

The Septic System

A septic system is a highly efficient, self-contained, underground wastewater treatment and disposal system that promotes natural biological processes to treat wastewater. When properly maintained, a septic system can successfully treat wastewater for many years. Septic systems consist of two major components – a septic tank and a drainfield.

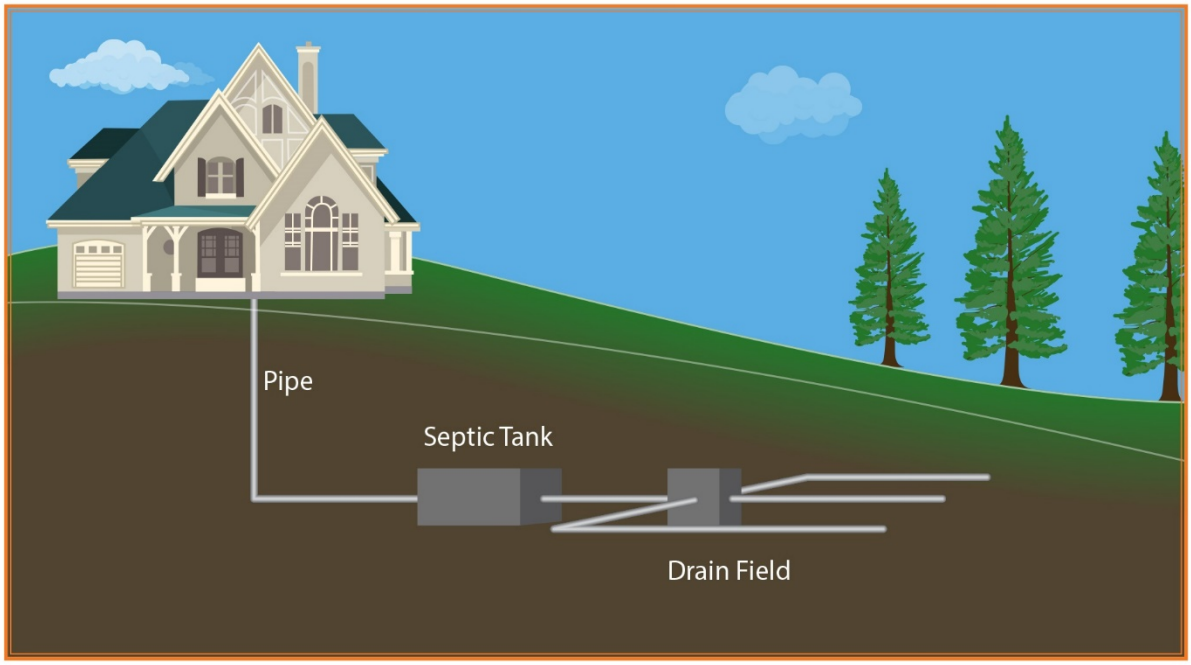
Conventional Systems

The **septic tank** is a watertight box constructed of concrete, fiberglass, or high-density polyethylene. The septic tank is where the *primary* stage of treatment occurs – physical separation. Heavier solids sink to form the *sludge layer* and *FOG* (fats, oils, and grease) float to the top forming the *scum layer*. The layers of sludge and scum remain in the septic tank where natural bacteriological processes work to break down solids. Baffles and effluent filters are often installed inside the tank to ensure solids that cannot be broken down remain in the tank until the tank is pumped. Newer tanks may have risers at the ground surface that permit easy access for inspection, location, and maintenance.

Following physical separation, partially clarified wastewater called *sewage effluent* flows from the septic tank, through a distribution box to the **drainfield**, also called leach field, leaching field, disposal field, field lines, or soil absorption field. A standard drainfield is a network of perforated pipes buried in 12 to 60-inch-deep trenches lined with gravel or coarse sand. A geologist, engineer or soil scientist will perform a site evaluation to determine soil permeability and appropriate burial depth. The trenches are often covered with geo-textile paper or fabric and then backfilled with native soil. Common drain field construction methods and materials can vary by location. Check with your local environmental health department for construction methods and materials common in your area.

In the drainfield, sewage effluent trickles from the perforated pipes and onto the beds of rock below. A *biomat* of bacteria, protozoa, fungi and other materials develops on the rock bed, naturally treating the water by feeding on organic and nutrient contents. The treated water is further clarified by additional biological and natural filtration processes as it moves through the soil.

Sample Septic System



This image is intended to represent some of the components that can be included in a septic system and is not intended as an installation guide. Check local codes for actual requirements and restrictions.

Alternative Systems

When native soils cannot provide adequate treatment or disposal on their own, alternative treatment systems are used to simulate ideal soil conditions. Common issues include:

- Too little available soil
- High average rainfall
- High seasonal or perched water table
- Soils with low-permeability
- Soils with too much bedrock or sand
- Site with limited available area for set-back distances
- Environmentally sensitive areas where effluent requires more treatment before entering the drainfield

Common examples of alternative systems include *aerobic treatment units (ATU),* which use oxygen to break down solids, produce cleaner wastewater than conventional systems and often used in environmentally sensitive areas. When minimal soil is available for proper treatment *mound systems* raise the drainfield to ground level and *sand filter systems* use a sand filter and pump to treat and disburse effluent.

Where water tables are seasonally high or perched aquifers create high water tables, *curtain drains* can be installed uphill of septic systems to divert excess water from inundating the drain field and rendering it ineffective. Grey to yellow subsoils develop in soils that are wet during a portion of the year, indicating high seasonal water levels. Contact your local health department, soil scientist, or engineer for assistance with sites that do not meet ideal conditions for a conventional septic system.

Location

Septic systems must be installed at safe distances from drinking water wells, streams, lakes, and houses to protect water quality from the risks posed by untreated wastewater.
Minimum vertical and horizontal distances are established by state and local agencies to protect surface and groundwater. The U.S. Environmental Protection Agency recommends a minimum of 50 feet between your well and your septic tank or drainfield, and it is ideal to install the septic system downhill of the well if possible.

Homeowners who buy a property on which the septic system does not meet minimum separation standards should test their drinking water for bacteria at least twice annually due to the potential increased risk to their health.

Maintenance

Just like water well systems, septic systems require a regularly scheduled maintenance program to ensure proper function. Homeowners should create a septic maintenance log and keep it with their well maintenance log.

Proper maintenance of a septic system includes:

- Regular inspection every 1 to 2 years
- Have the system pumped every 3 to 5 years, depending on demand
- Water conservation can reduce the amount of demand placed on the system and prolong its useful life

Protection

Everyone in the household must consider what is flushed into the septic system as they can reduce or damage the natural function of the septic system. Avoid flushing items that can clog the system or chemicals that can contaminate ground and surface water, and potentially damage the biological components of the system.

DO NOT flush grease, fats, oils, bandages, feminine hygiene products, disposable diapers, paper towels, kitty litter, cigarette butts, coffee grounds, dental floss, hair, paint, pesticides, varnish, thinners, waste oil, or other chemicals. Ideally ONLY water and household detergents are flushed into the system.

The septic system's drainfield must also be protected. The following strategies are recommended to protect the field and prolong its functional life:

- Do not drive over the drainfield with cars, trucks or heavy equipment.
- Do not plant trees or shrubbery in the drainfield area as roots can plug or damage the wastewater distribution lines.
- Do not cover the drainfield with hard surfaces such as concrete or asphalt. Grass is the best cover because it will help prevent erosion and help remove excess water.
- Divert surface runoff water from roofs, patios, driveways and other areas away from the drainfield.
- Do not flush disposable wipes – even wipes that say 'flushable' should not be flushed.

A properly maintained septic system poses no threat to the groundwater that supplies a household well. However, wastewater from a failing septic system can carry contaminants such as nitrates, harmful bacteria and viruses into groundwater and potentially the well.

WSC provides additional publications on well and well water protection at https://www.watersystemscouncil.org/water-well-help/wellcare-info-sheets/ or request hard copies by contacting our wellcare® Hotline at 888.395.1033 or info@wellcarehotline.org.

For More Information on Septic Systems

U.S. Environmental Protection Agency. Septic Systems (Onsite/Decentralized Systems). https://www.epa.gov/septic

Home*A*Syst: Home Assessment Guide – Michigan State University Extension Bulletin WQ-51 http://www.greenoaktwp.com/Home_Assessment_Guide.pdf

Kansas Home*A*Syst: An Environmental Risk Assessment Guide for the Home – Kansas State University Agricultural Experiment Station and Cooperative Extension Service https://bookstore.ksre.k-state.edu/pubs/HOMEASST.pdf

Region 6 South Central Public Health Training Center (R6-SCPHTC). EPOCH:05 Wastewater. Tulane University – School of Public Health and Tropical Medicine. https://r6phtc.sph.tulane.edu/

FOR MORE INFORMATION to help maintain and protect your water well system:

wellcare® is a program of the **Water Systems Council (WSC)**. **WSC** is the only national organization solely focused on protecting the health and water supply of more than 13 million households nationwide who depend on private wells.

This publication is one of more than 100 **wellcare®** information sheets available FREE at www.watersystemscouncil.org.

Well owners and others with questions about wells and well water can contact the **wellcare®** Hotline at 1-888-395-1033 or visit www.wellcarehotline.org to fill out a contact form or chat with us live!

JOIN THE WELLCARE® WELL OWNERS NETWORK!

By joining the FREE **wellcare®** Well Owners Network, you will receive regular information on how to maintain your well and protect your well water.

Contact us at 1-888-395-1033 or visit www.wellcarehotline.org to join!

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